CHAPTER 3.11
TEST FILL

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3.11-1. GENERAL. A test fill is a simulated section of the landfill cover or liner. Test fills are constructed prior to full scale construction for the following reasons:

- To verify the contractor can construct the landfill cover or liner as specified without damaging the geosynthetics;
- To determine if interface frictional resistance between the various components of the landfill cover or liner is adequate to prevent slope failures;
- To allow the contractor to determine placement methods for natural soil components;
- To allow sealed double ring infiltrometer (SDRI) testing to be performed (Refer to ASTM D 5093 and EPA/600/R-93/182 if a SDRI test will be performed as a component of the test fill evaluation process); and
- To verify whether the field placement methods will achieve the required hydraulic conductivity of the low permeability clay layer.

Test fills are typically 10-15 m (30-50 ft) wide and 20-30 m (65-100 ft) long. The length of time which a test fill will be monitored after construction varies from project to project and depends on the type of testing which will be performed.

a. Equipment.

Ensure that equipment used for the test fill is the same type that is specified for full scale construction.

b. Preconstruction Submittals. The contractor should provide preconstruction submittals as required by the specifications. The following is a list of typical submittal requirements.

(1) Other specifications require submittals related to the cap or liner system. These submittals should be made and approved in advance of the test fill section construction.

(2) Test Fill Plan describing the proposed test fill section construction. The plan should include the following:

- Drawings including plan views, sections, and details;
- Sequence of operations;
- Survey marker layout including monitoring to be performed;
- Surface water controls and diversion; and
- Equipment to be used including proposed operating speeds, traffic pattern, and number of passes.

c. Construction Submittals. The contractor should provide construction submittals as required by the specifications. The following is a list of typical submittal requirements.

(1) Weekly Post-Construction Monitoring Reports including the most up to date test results and survey data from the test fill.

(2) Final Test Fill Construction Report which includes as-built drawings, videos, all survey data and test results, and conclusions related to test fill construction and monitoring.

3.11-2. PRODUCTS. Ensure all materials used to construct the test fill are the same as will be used for construction of the full-scale landfill.

3.11-3. EXECUTION.

a. General.

(1) Verify the contractor is constructing the test fill to the specified dimensions at the location shown on the drawings. Typically, the test fill should be a minimum of 3 to 4 times wider than the compaction equipment and long enough to allow construction equipment to achieve normal operating speed.

(2) Verify the completed test fill slope is correct. The test fill slope is critical if the purpose of the test fill is to determine if interface frictional resistance is adequate between the various layers of geosynthetics.

(3) Layout.

(a) If surveys are to be performed on the test fill, a coordinate system should be established with one axis parallel to the bottom and top edges and the other axis parallel to the sides of the test fill section.

(b) The contractor should also establish a benchmark outside of the landfill boundaries to ensure accurate surveys are made.

b. Placement.

(1) Verify the area where the test fill will be placed is cleared and grubbed as required by the specifications.

(2) Drainage controls should be constructed to divert runoff around the test fill area. The drainage controls should be maintained until the completion of the post-construction monitoring period.

(3) Verify the subgrade (existing landfill surface) is compacted as described in the specifications.

(4) Foundation soil should be placed on top of the subgrade to establish the required slope.

(5) Check the plans and specifications to determine the minimum thickness of the foundation soil layer beneath the test fill. This layer is typically a minimum of 300 mm (12 inches) thick.

(6) Anchor Trench.

(a) Check the plans and specifications to determine if the test fill should include an anchor trench.

(b) Verify the anchor trench is constructed to the correct dimensions along the full width of the top of the test fill.

(c) Check the plans and specifications to determine which geosynthetics should be placed in the anchor trench.

(d) Verify the anchor trench is backfilled as specified.

(7) Survey Control Points.

(a) Survey control points typically consist of 450 mm (18 inch) long steel pins set in the soil on top of and back from the edge of the test fill.

(b) Verify permanent marks are placed (painted) on each layer of geosynthetic material to allow relative movements to be determined.

(c) Survey control points are usually surveyed immediately after construction and every 5 to 7 days thereafter over the life of the test fill.

(d) Horizontal and vertical movement is typically monitored to the nearest 3.0 mm (.01 feet). Verify the specifications address the maximum allowable relative movement of the test fill. Contact the designer if this information is not provided.

c. Tests.

(1) Post-Construction Monitoring.

(a) Ensure the contractor inspects the test fill daily and reports its condition in the Construction Quality Control Daily Reports.

(b) Video taping is often required during construction and post-construction monitoring to document the condition of the test fill.

(2) Low-Permeability Clay Layer.

(a) Inspect the clay layer during construction to verify materials and placement methods are as specified for full scale construction.

(b) If Shelby tube samples are taken for hydraulic conductivity testing, they should be taken from the clay layer at locations you specify.

(c) Shelby tube samples should be extruded and visually examined for signs of inadequate bonding between lifts.

(d) Generally, at least one set of classification tests (ASTM D 422, ASTM D 1140, and ASTM D 4318) should be performed on each lift of clay placed.

(e) The contractor should also perform field density, moisture content, and hydraulic conductivity tests (ASTM D 5084) on each lift of the test fill clay layer. The specifications should indicate the number of tests which should be performed per lift.

(4) Geosynthetics Testing. Determine if leak, peel, and shear

tests are required to be performed on the geomembrane seams.

(5) Dismantling.

(a) After construction and monitoring of the test fill is complete, the contractor should carefully remove the soil layer from a small area (typically 3 m X 6 m (10 feet by 20 feet)) above the geosynthetics.

(b) Visually inspect the geosynthetics and document areas of damage.

(c) Additional areas of the test fill section should be examined in a similar manner if it appears the geosynthetics have been damaged. The inspection operation is often videotaped.

d. Approval. Excessive slippage or damage to geosynthetics resulting from the contractor's placement methods should result in rejection of the contractor's placement methods.

e. Removal.

(1) After approval of the Final Test Fill Construction Report, the contractor should remove the test fill section.

(2) Determine the suitability of natural soils for reuse. If reused, the contractor should stockpile and protect these materials.

(3) Geosynthetics are usually removed and discarded.

f. Full-Scale System Placement.

(1) Do not allow the contractor to begin construction of the full-scale liner or cover system until approval of the Final Test Fill Construction Report.

(2) Only methods and equipment used during test fill construction should be used for full-scale construction unless otherwise approved.